

WHAT IS CLAIMED IS:

- 1 1. A data transfer controller comprising:
2 a request queue controller capable of receiving,
3 prioritizing and dispatching data transfer requests each
4 specifying a data source, a data destination and a data
5 quantity to be transferred;
6 a data transfer hub connected to the request queue
7 controller for receiving dispatched data transfer requests;
8 a plurality of ports having an interior interface
9 connected to the data transfer hub which is so configured as
10 to be the same for each port and an exterior interface
11 configured for an external memory/device which, in operation,
12 is connected to said port, the interior interface and the
13 exterior interface being connected for data transfer
14 therebetween;
15 wherein the data transfer hub being capable of
16 controlling data transfers from a source port corresponding to
17 the data source to a destination port corresponding to the
18 data destination in quantities corresponding to the data
19 quantities to be transferred under a currently executing data
20 transfer request; and
21 wherein at least one of said plurality of ports consists
22 of an active data port connected to said request queue
23 controller capable of specifying a data source, a data
24 destination and a data quantity to be transferred.

1 2. The data transfer controller of claim 1, wherein:
2 said active data port capable of generating a data
3 transfer request specifying said active data port as said data
4 destination;

5 wherein said data transfer hub generates a read command
6 to said data source and transfers read data to said active
7 data port.

1 3. The data transfer controller of claim 2, wherein:
2 said data transfer hub generates a pre-write command to
3 said active data port prior to transferring said read data to
4 said active port; and

5 said active data port generates an acknowledge signal to
6 said data transfer hub following receipt of said pre-write
7 command when said active data port is ready to receive data.

1 4. The data transfer controller of claim 1, wherein:
2 said active data port capable of generating a data
3 transfer request specifying said active data port as said data
4 source;

5 wherein said data transfer hub generates a read command
6 to said active data port and transfers read data to said data
7 destination.

1 5. The data transfer controller of claim 4, wherein:
2 said interior interface of said active data port supplies
3 a read data command to said exterior interface of said active
4 data port in response to read data command of said data
5 transfer hub.

1 6. The data transfer controller of claim 4, wherein:
2 said interior interface of said active data port includes
3 a first-in-first-out buffer;
4 said exterior interface writing data into said first-in-
5 first-out buffer upon generation of said data transfer request
6 by said active data port; and
7 said interior interface supplying data read from said
8 first-in-first-out buffer upon receipt of said read command
9 from said data transfer hub.

1 7. The data transfer controller of claim 6, wherein:
2 said interior interface of said active port generates a
3 stall signal to said exterior interface of said active port
4 when said first-in-first-out buffer is full; and
5 said exterior interface refrains from writing data into
6 said first-in-first-out buffer upon receipt of said stall
7 signal.

1 8. A method of data transfer comprising the steps of:
2 receiving, prioritizing and dispatching data transfer
3 requests each specifying a data source, a data destination and
4 a data quantity to be transferred;
5 transferring data from a source port selected from a
6 plurality of ports corresponding to the data source to a
7 destination port selected from said plurality of ports
8 corresponding to the data destination in quantities
9 corresponding to the data quantities to be transferred under
10 a currently executing data transfer request;

11 wherein at least one of said plurality of ports is an
12 active data port capable of specifying a data source, a data
13 destination and a data quantity to be transferred.

1 9. The method of data transfer of claim 8, wherein:
2 said active data port is capable of generating a data
3 transfer request specifying said active data port as said data
4 destination.

1 10. The method data transfer of claim 9, further
2 comprising the steps of:
3 supplying a pre-write command to said active data port
4 prior to transferring said read data to said active port; and
5 supplying an acknowledge signal from said active data
6 port following receipt of said pre-write command when said
7 active data port is ready to receive data.

1 11. The method of data transfer of claim 8, wherein:
2 said active data port is capable of generating a data
3 transfer request specifying said active data port as said data
4 source.

1 12. The method of data transfer of claim 11, further
2 comprising the steps of:
3 writing data into a first-in-first-out buffer upon
4 generation of said data transfer request by said active data
5 port; and
6 supplying data read from said first-in-first-out buffer
7 upon receipt of a read command by from said active data port.

- 1 13. The method of data transfer of claim 12, further
- 2 comprising the steps of:
- 3 generating a stall signal when said first-in-first-out
- 4 buffer is full; and
- 5 refraining from writing data into said first-in-first-out
- 6 buffer upon generation of said stall signal.

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